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The CHEMIST

OCTOBER, 1937 VOLUME XIV, NO. 7

THE LIMITATIONS OF PHYSICAL SCIENCE

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A CHEMICAL ENGINEER'S EDUCATION IN U.S.S.R.

A LESSON IN ITSELF

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TABLE OF CONTENTS

Editorial 223

The Limitations of Physical Science—*Joseph F. Padlon, F.A.I.C.* 225

A Chemical Engineer's Education in U.S.S.R.—*Rudolf Seiden* 230

Leo P. Chebotar 233

Positions Available 234

Positions Wanted 235

Council 236

Chapters 238

Our New Members 239

From Our Readers 244

Chemists Abroad—*J. N. Taylor, F.A.I.C.* 245

Northern Lights—*Howard W. Post, F.A.I.C.* 247

Books 248

News 249

THE AMERICAN INSTITUTE OF CHEMISTS
HOWARD S. NEIMAN, *Secretary*
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EDITORIAL

Progress

THE AMERICAN INSTITUTE OF CHEMISTS for several years has been working toward the establishment of a Bureau of Appointments which would function to place men where they can serve best, independent of whether or not they are employed at the time. In other words, to bring the man to the need that exists for his service.

An important step toward this goal was achieved last spring, when the Backus Committee reported in favor of turning over the work of the Committee on Unemployment and Relief for Chemists and Chemical Engineers in metropolitan New York to THE AMERICAN INSTITUTE OF CHEMISTS, provided that a formal program be submitted and approved. This program is being prepared by a committee headed by Mr. Frank G. Breyer, who is well-known for his efforts in behalf of the unemployed chemist.

A discussion of the employment of chemists was presented by Dr. W. T. Read at the 1937 annual meeting of THE INSTITUTE, and was reported in the May issue of THE CHEMIST. It included a brief survey of the information obtained by the Chemists' Unemployment Committee as prepared by the able secretary of that committee, Mr. M. R. Bhagwat, and promised the coöperation of the INSTITUTE with all scientific and technical societies in furthering its desire to be of the greatest possible service to the chemist.

While the Chemists' Unemployment Committee is at present a local committee, progress toward the goal of national scope is indicated. There are still many problems to be solved and much to be done before the objective of a Bureau of Appointments, national in its contacts, available to all chemists and employers of chemists, is reached.

Mr. A. Cressy Morrison, chairman of the finance committee of The Committee on Unemployment for Chemists, whose splendid work there is a matter of record, has consented to speak on the general subject of the employment of chemists, before a meeting of the New York Chapter of THE AMERICAN INSTITUTE OF CHEMISTS to be held October 29th at The Chemists' Club, New York, N. Y. All chemists who are interested in this important subject are invited to be present at this meeting.

New Certificates

Those Fellows and Associates of THE AMERICAN INSTITUTE OF CHEMISTS who have not yet received certificates of membership may expect them shortly. The new certificates are now at the engravers and will be signed and mailed as soon as possible.

Council Meeting

A meeting of the National Council of THE AMERICAN INSTITUTE OF CHEMISTS will be held on Thursday, October 28, 1937, at six o'clock, in The Chemist's Club, 52 East 41st Street, New York, N. Y.

New Roster

Present plans include a new roster to be issued in January, 1938. Cards will soon be sent to the membership requesting name, position, and business connection, and members are urged to return them as promptly as possible to the Secretary's office. New members elected at the November meeting of the Council will be included in this roster.

Write for THE CHEMIST

THE CHEMIST will welcome articles of discussion on professional subjects, opinions when substantiated by facts, and particularly news about the activities of members. Biography is also acceptable, as well as interesting items pertaining to chemists or chemistry. The professional aspect of chemistry, rather than the science, should be stressed.

The Limitations of Physical Science

By **Joseph F. Padlon, F.A.I.C.**

"Science cannot exist without some small portion of metaphysics."—Planck

WHEN one approaches a topic such as is considered herein, there is a feeling of trepidation that much disagreement and perhaps condemnation will be evoked. However, as the years go by, it seems that Science is no longer the rash Prometheus it formerly was, with its rock-bound convictions. Its attitude in many matters has changed and is being changed, while its organic development is a good indication of the virility so characteristic of perennial youth. In viewing the relations of Science with other fields of knowledge, one must consider such relation not at close range where probably all sense of proportion may be lost but mentally at a distance, and with proper perspective and scope.

Experimental science, *i.e.*, physics and chemistry, has for its aim the formulation of general laws which must be derived from the observation of individual phenomena, that is, outward manifestations of external reality by the senses; such laws being statements of what actually does happen.

Man with his characteristic curiosity has searched the heavens trying to penetrate their farthest dim recesses for the inner secrets which were long hidden to the unaided eye. He invented and developed powerful yet delicate instruments of amazing precision for use as tools in wresting Nature's secrets, probing from the largest to the smallest particle in the physical world. His insatiable curiosity has driven him further and further in the quest for truth, probing even the mysterious workings of the mind of man, himself. He has catalogued, classified, and formulated theories and laws based on all these observations. He has even duplicated Nature by experimentation. But in his mind, the perennial "Why?" is asked, and for the ultimate answer the scientist must resort to other fields of knowledge.

Before the time of Comté (1798-1857), science worked hand in hand with philosophy and was making startling progress. Comté, adopting the essentials of Kant's doctrines of the *Critique of Pure Reason*, guided the new movement of his time to a positivistic view of the universe, namely that science is autonomous and self-contained and its criterion

is not truth but utility or pragmatism[1]. Thus science is philosophy, metaphysics notwithstanding. Since Comté's time, and more particularly since the beginning of the present century, a drastic "revolution" has occurred in science, whose effects are more far reaching than those caused by Newton's *Principia*. The Newtonian concept of mass, which was considered something solid and "substantial," being in absolute time and space, gave way to the modern views of physics wherein matter was electrical and relative with space and time as set forth by Einstein and others. Furthermore, a new non-Euclidian mathematical outlook was developed as an important adjunct of these modern views of physics.

Science was developing to the point where its searches extended from the macroscopic to the microscopic level of matter. Causes and effects were studied, leading up to certain ideas on efficient causality. There are for example arbitrary causes, *e.g.*, where the experimenter heats water in the laboratory, and necessary causes, *e.g.*, in nature when the sun evaporates water by its heat rays. Causality is generally considered among scientists as the sequence of events in "external nature", thereby distinguishing from the purely subjective category of Kant, Comté, *et al*. These events of nature occurring with regularity and which are oftentimes duplicated in the laboratory, enable scientists to write the laws which can mathematically be expressed and subjected to all the machinations of the mathematical mind without affecting their veridical correspondence to facts whether obtained by observation or by experiment. However, among scientists, certain irregularities were noted in some of their observations giving rise to a variation from the uniformity expressed in the physical law. In not knowing the antecedent causes or material conditions very well, it was not possible for the modern scientists to state the exact determinants which brought about the result giving it its particular attribute. The discovery of these irregularities caused much disturbance in scientific circles in recent years. Empiricism was being shaken at its foundations.

Man in endeavoring to perfect his instruments for accurate measurements reached a limit. Many doubts arose regarding the trend of modern science. The application of classical mechanics to the behavior of "small world" systems failed.

Planck's quantum implied a fixed objective limitation of the degree of exactness which can be reached and within which limitation are found not only doubt but also contingency. For constancy, there was inconstancy. Planck's quantum theory was further enforced by N. Bohr's

[1] Auguste Comté: *Positive Philosophy*. Martiman's translation.

theory of electrons "jumping" from their orbits or rising or falling from different energy levels in the atom thereby changing their orbits. Thus arose the "principle of indeterminacy", developed by Heinsenberg and Schroedinger[2], which was supposed to have overthrown causality.

The theory of Planck was based originally from the radiation of light and heat which was defined "as a discontinuous mass made of units, photons, all of which are similar to one another"[3]. This theory not only disturbed the mathematical interpretation of the universe but also the very observations of physical phenomena. It was found that the photon of which light is made up gave an electron a kick thereby preventing the report of its exact position. It was not possible to determine what a photon would do in a given instance, thereby presenting apparently contradictory properties of a wave and of a bullet-like particle. Mass was not constant, it varied with velocity and theoretically was capable of becoming large beyond all limits, nor was time unconditioned by motion. Thus, Einstein was able by the theory of relativity to put the finishing touch to the crisis affecting the foundation of physical science.

The "sharply defined causality which is evident in macroscopic physics"[4] was not evident in the new physics which "got rid of mechanical determinism, but only at the price of getting rid of uniformity of nature as well"[5].

With these difficulties presenting themselves as scientists made further physical and mathematical investigations, several reasons were offered to explain these apparent conflicts between the principles of causality and of indeterminacy.

Some scientists[6] held fast to determinism as relating to the photons, electrons, protons, etc.; because we do not know enough about the details or determinants. In other words, there was a realization of an admitted interference with the course of nature by arbitrarily superimposing from the outside certain changes having no connection with the system of observation[7]. In order to compensate for a lack of knowledge of the determinants involved in an event, mathematicians had to resort to "probability", thereby giving rise to mathematical concepts which many scientists thought should be duplicated outside the mind, thus giving rise to an idealism verging on the poetical or mystical plane. Good examples

---

(2) Heinsenberg: *The Physical Principles and the Quantum Theory.*
(3) Planck: *Where is Science Going?* p. 119.
(4) Arthur Haas: *Wave Mechanics and The New Quantum Theory.* Page 119. (London 1928).
(5) Sir James Jeans: *The New World Picture of Modern Physics.* NATURE (Sept. 7, 1934).
(6) *Science et Loi* (Paris, Alcan, 1934).
(7) Bridgman: *The Logic of Modern Physics.* p. 81.

of this tendency are the rules of calculation set forth by the application of Schroedinger's operators, Heinsenberg's matrices or Dirac's Q numbers.

Was it necessary for our thoughts to be identical mirror images of nature? Thoughts may be true even though not found in the world of time, space, and matter. Sensible images had mathematical expressions which represent them as analogous to the real facts[8].

Experiment must continue in order to determine the "all and only antecedent factors". However, there is a limit to the accuracy of measurements in atomic physics because the instruments used are of atomic construction and the accuracy of such an instrument would be limited by its own sensitivity. "A weigh-bridge cannot weigh to the nearest milligram"[9]. The point is reached where the smallest particle cannot be further divided physically although it can mathematically.

The new laws discovered by mathematical science should be not for the unmaking or flouting of the old but laws which are to be considered as refinements of the old. Can it be accomplished by pure mathematics? Hardly, for quantitative aspects reach a limit. The mind of the investigator develops intellectual experiments or abstractions which are more subtle than atoms, photons, or electrons[10].

The coöperation of Philosophy, the handmaid of science, must be invoked. The categories of qualities, the substantial form of the Scholastics, must be considered. Man's concept of the universe must be more than objective, more than "a mere machine or clock", nor should it be considered a statistical device translated solely by mathematics. That this is not so is apparent from our simple chemical reactions of an inorganic nature where affinity and valence in an operation play an important part. Pure mechanics finds the greatest of difficulties in explaining affinity and valence because the discrimination and the limitation of the atoms are qualitative factors. Scientists must take into consideration forces other than mechanical in order to offset the nightmare caused by postulating the contingency of physical laws.

Man as an intelligent being must, therefore, look to the ultimate nature of things, besides their numerical relations. Scientists, therefore, must seek the aid of other fields of knowledge. Professor Eddington hints that to attempt to describe Nature mathematically is only a partial description[11]. Scientific investigation does not get to the intrinsic

[8] Plincare: *The Foundation of Science*, p. 140.
[9] Planck: *The Philosophy of Physics*, p. 26.
[10] Planck: *The Philosophy of Physics*, p. 27-8.
[11] Sir A. S. Eddington: *The Nature of the Physical World*, p. 303.

nature of things. It is apparent that "the structure of the physical view of the world is moving farther and farther away from the world of sense, and assuming more and more abstract forms"[12].

Philosophy aids the physical sciences in establishing the objectivity of the phenomena with which it is dealing, thereby forming a harmonious union long desired, but sometimes not sought. As Planck so well puts it: "There have been times when science and philosophy were alien, if not actually antagonistic to each other. These times have passed. Philosophers have realized that they have no right to dictate to scientists their aims and the methods for attaining them and the scientists have learned that the starting point of their investigations does not lie solely in the perceptions of the senses, and that science cannot exist without some small portion of metaphysics. Modern physics impresses us particularly with the truth of the old doctrine which teaches that there are realities existing apart from our sense perceptions, and there are problems and conflicts where these reactions are of greater value for us than the richest treasure of the world of experience"[13].

Must the scientist of the future study the art of the bookmaker, instead of that of the trainer and art maker in his interpretation of reality;[14] or must the laws he formulates be significant and permanent? These questions only the future will be able to answer. The time is not yet ripe for modern science to foretell its possibilities until it can and will take into account the norms of knowledge as important aids.

In conclusion, it is hoped that the adoption of metaphysics, that important branch of philosophy, as an aid in our scientific study of the Universe will culminate in a theory and a life leading onward to Truth[15].

> "But beyond the bright search-lights of science,
> Out of sight of the windows of sense,
> Old riddles still bid us defiance;
> Old questions of Why and Whence.
>
> "There fail all sure means of trial.
> There end all the pathways we've trod,
> Where man, by belief or denial,
> Is weaving the purpose of God"[16].

---

[12] **Planck:** *The Universe in the Light of Modern Physics*, p. 59.
[13] **Planck:** *The Universe in the Light of Modern Physics*, p. 113.
[14] **Sir A. S. Eddington:** *The Nature of the Physical World*, p. 301.
[15] **F. J. Sheen:** *Philosophy of Science*, p. 162.
[16] **Whetham:** *Recent Development of Physical Science*, p. 10.

A Chemical Engineer's Education in the U.S.S.R.

By **Rudolf Seiden**

What kind of training is given a Soviet chemical-engineer and how much of this training is devoted to the principles of construction of chemical apparatus? These two questions were studied during the writer's recent, personal visit to the U.S.S.R.

Public education in the U.S.S.R. is still in the evolutionary stage. With regard to curriculum, it has, yet, taken no definite form. It often happens that in the same type of school will be found entirely different courses of study. Some developments, however, are worthy of mention.

Since 1932, compulsory education has become universal for the entire Soviet Union. The technical schools are recognized as the most important and the most advanced. The curricula of these is devoted to the training of specialists. That is, students there learn little general knowledge, but instead receive intensive training in the narrow field of their choice. Instruction in the building of chemical apparatus, for example, is an entire and separate course in the schools of chemical technology. It must be stressed, however, that there were many schools which, owing to deficiency of well-trained professors, almost or entirely neglected this branch of instruction. There was, therefore, at one time a strong demand in the U.S.S.R. for scientific men skilled in the construction of chemical apparatus with experience as instructors.

At six or seven, Soviet children become of school-age and are required to enter an elementary school, which they attend for seven years. They then enroll in a technical school having many highly specialized departments. It is not possible for the student to receive at these schools a course in general chemistry; he must enroll, for example, in the department of coke-chemistry. Upon completion of the elected course (four years) the student becomes eligible to pursue his studies further in one of the technical universities, which as previously mentioned, have departmental faculties.

One of the best-known Soviet universities is the Mendelejeff Institute of Chemistry and Technology in Moscow. The course of study here lasts four years and is divided into twelve trimesters. The Mendelejeff Institute has two main divisions, the Chemical-technical and the Mechanical-chemical departments. Each of these is sub-divided into the following faculties: Coke and Benzol; Dyestuffs; Fats and Oils; Sugar; Milling; and Heavy Inorganic Materials. In the Chemical-technical department, the students will study chemical processes; their colleagues of the Mechanical-chemical department, however, will study machinery and apparatus.

The writer spoke with students and professors of the various faculties at Mendelejeff Institute, while observing the system there, and believes it possible to say that graduates are as well-versed in the practical relations of their narrow branch as in the theoretical. Considering the fact that the U.S.S.R. needs to produce as many engineers as possible in the shortest possible time, the narrow, intense training of these engineers is somewhat justified. However, the fact should not be overlooked that the Soviet engineer is less informed concerning general chemical questions and the relations of chemistry and technology than are engineers given a more general training.

A student, enrolled under the Coke and Benzol faculty in the Chemical-technical department of Mendelejeff Institute, submitted a program of his course for the writer's examination. The program indicated that the student would attend one trimester (the seventh) of lectures on construction of apparatus used in the coke and tar industry. In the lecture room and laboratory, the machinery and apparatus necessary to this industry would be described, calculated and constructed. (In the Mechanical-chemical division, the construction and production of the machinery and apparatus would be stressed.) Frequent excursions would be made to factories in order to observe common practice and to study the machinery and apparatus in operation.

Many of the university students are not graduates of the technical schools. These have spent much time in actual practice. A three-year preparation course is required of them before admittance to a university is granted. Examinations are dispensed with in Soviet universities, but assignments are not. The instructor denotes the progress of his students

by their recitations and discussions. Low-ranking students, however, must take examinations. If they are thus shown to be incapable of carrying on the work, the matter is taken up by the faculty and they are dropped from the university. The state and the industries contribute to Soviet university students a reasonably high, monthly scholarship. A state regulation requires that seventy per cent of all university students must be workers or children of workers, and allows but thirty per cent from other classes.

Scientific Progress in India

As a result of nearly a year's work of installation, the new Department of Technology of the University of Bombay, India, is now completely equipped and has begun to function in all its activities. After a delay of many years provision has at last been made in the Presidency, whereby men, well-groomed in science, can obtain a post-graduate training in chemical technology in an institution which is regarded in all its essentials to be equal to the best equipped technological adjunct of any university in the world. A large measure of credit for establishing the Department is due to the present Vice-chancellor, Mr. V. N. Chandavarker, and Dr. R. B. Forster, the Director of the Department.

The main object of the Department is to form a link between science and industry. This link makes it possible for the graduate in pure science, who is industrially minded, to prepare himself for an important part in industry, thereby forming an outlet for the products of the colleges; it will also serve as a source of supply of men for the needs of Indian industries; and lastly, as a home of research, it will help development of new ideas, and problems suggested by industrialists can be tried out on a practical scale.—*The Industrial Chemist.*

"We Need More Inventions"

Dr. Frederick G. Cottrell, who received the Washington Award from the Western Society of Engineers, at a dinner in Chicago on February 23, 1937, believes that the cure for any evils resulting from inventions is more inventions to create more products, provide more jobs and raise standards of living. Further, he believes that inventions are chiefly valuable for their potential benefit to humanity rather for the

profit which may accrue to the inventor. Consistent with his belief, he assigned in 1912 a number of his most valuable patents to the Research Corporation of New York to further technical research for the benefit of humanity. In 1935, he and others organized Research Associates, Inc., with laboratories in Washington D. C., along the same lines as the Research Corporation. Any profits made, either from patents or from research fees paid by the sponsors of individual projects, go back to pay the cost of more research. Dr. Cottrell is widely known for his process of electrical precipitation to collect suspended matter carried by gases, and also for his process of electrical dehydration of petroleum emulsions. He also developed the process for the manufacture of helium gas from natural gas at a cost which permitted the use of helium in aircraft.

Leo Peter Chebotar

THE AMERICAN INSTITUTE OF CHEMISTS records with regret the death of Leo Peter Chebotar, F.A.I.C., on August 18, 1937.

Dr. Chebotar was born in Russia on June 11, 1878, and became an American citizen in 1922. His degrees were that of engineer from the Institute of Technology, Petrograd, and Doctor of Chemistry from the University of Naples, Italy. He specialized in petroleum refining, oils, fats, and soap dyestuff intermediates, and the science of technical research. He held three United States patents and was the author of a technical article. From 1921 to 1932, he was employed by The Texas Company, Inc., New York, N. Y., as librarian and later on research work. At the time of his death, he was working on a statistical survey being made by the Water Supply Department of New York City.

E. J. Crane, Editor of *Chemical Abstracts*, has been elected by the Medal Committee of the American Section of the Society of Chemical Industry to receive the Chemical Industry Medal for 1937. The medal will be presented on November fifth, at The Chemists' Club, New York, N. Y.

EMPLOYMENT

Production Supervisor

Production supervisor wanted for rayon plant: chemical engineer with degree, age thirty-five or forty, protestant, with considerable experience in the production of rayon, celluloid, and cellulose products. Salary $5000. Please reply to Box 21, THE CHEMIST.

Chemical Engineer Wanted

Chemical Engineer about twenty-seven years of age with plant experience and sales personality to sell chemical equipment to process industries. New department of old established company. Please reply to Box 12, THE CHEMIST.

Instructor in Textile Chemistry

Wanted: Instructor for evening course in textile chemistry one night a week during school year. Man should be 35 or over, college trained with practical laboratory and mill experience, some teaching experience, necessary personality and patience. Course will cover the principles involved in such operations as scouring, boiling off, mercerizing, bleaching, dyeing, and printing of all textile fibres, yarns, and fabrics. Please reply to Box 23, THE CHEMIST.

Synthetic Rubber Chemist

Chemist with degree, Christian, experienced, wanted for research, development, production of synthetic rubber. Salary open. Please reply to Box 25, THE CHEMIST.

Rubber Chemist

Rubber chemist wanted for foreign work. Single, under thirty-five, big physically, college degree, Christian. Experience in physical, colloid, and organic chemistry, and some engineering. Four year contract. Salary $4000 and traveling expenses. Please reply to Box 27, THE CHEMIST.

Chemical Engineer

Chemical engineer wanted in metropolitan New York. College degree and experience required in oil refinery process design. Salary $4200. Please reply to Box 29, THE CHEMIST.

Readers who know of employment opportunities for chemists may be of service to THE AMERICAN INSTITUTE OF CHEMISTS by sending such information to this department. Institute members qualify by training and experience for responsible positions.

Positions Wanted

Chemical Engineer, chemist, J.A.I.C., recent graduate (five year course, Ch.E. and B.S. degrees) age 25, single; six months' experience in edible oils, school research in electrochemistry; seeks suitable connection, research or control in any field, go anywhere. Please reply to Box 20, THE CHEMIST.

Chemist, J.A.I.C., winner of student medal in chemistry; thorough training as chemist, graduate work; little experience cosmetics, sanitation; desires any opportunity as chemist. Please reply to Box 22, THE CHEMIST.

Recent graduate with degree of B.S. in chemistry, desires position; age 22, religion Catholic, speaks, reads and writes Polish; has some knowledge of bacteriology. Please reply to Box 24, THE CHEMIST.

Fellow American Institute of Chemists wishes position. Ph.D. Columbia, with ten years' experience in biochemistry, vitamin and nutrition research, wishes a permanent position, preferably in the west. Research or teaching. Reprints of published articles and references will be furnished. Free January first. Please write Box 15, THE CHEMIST.

Bibliographer available, also able to do patent and research work, with knowledge of languages and very broad chemical education in Europe, well-known writer of technical articles. Please reply to Box 8, THE CHEMIST.

Married teacher seeks high school position. Two years' experience teaching chemistry and biology. B.Sc., J.A.I.C., A.R.R.L., New York Chemistry Teachers' Club. Four years assistant head trainer in sports and medical masseur's license. Grateful for immediate contact any part of country. Reply to Box 9, THE CHEMIST.

Members of THE AMERICAN INSTITUTE OF CHEMISTS seeking positions may send in brief announcements for this Department, without charge.

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September Meeting

The one hundred and forty-fifth meeting of the Council of THE AMERICAN INSTITUTE OF CHEMISTS was held at The Chemists' Club, 52 East 41st Street, New York, N. Y., on September 16, 1937, at 6:00 o'clock P. M.

President Maximilian Toch presided.

The following officers and councilors were present: Messrs. F. G. Breyer, H. T. Clarke, B. H. Knight, H. G. Knight, H. S. Neiman, W. T. Read, N. A. Shepard, M. Toch, Gerald Wendt, L. Van Doren, and F. W. Zerban.

The minutes of the preceding meeting were approved.

The Treasurer's report, showing a cash balance on hand of $1817.52 and all bills paid to date, was read, and upon motion made and seconded the report was accepted.

The Treasurer suggested a tentative budget for the balance of the year.

President Toch appointed a committee, consisting of Dr. Read and a member to be chosen by Dr. Read, to represent THE AMERICAN INSTITUTE OF CHEMISTS at the dedication of the new chemistry laboratory of the University of Delaware.

The following new members were elected:

FELLOWS

EUGENE AYRES, *Staff Chemist,* Culf Research and Development Company, Pittsburgh, Penna.

JOHN W. BODMAN, *Research Director,* Lever Brothers Company, Cambridge, Massachusetts.

GEORGE W. COLEMAN, *Research Chemist and Metallurgist,* Waltham Watch Company, Watertown, Mass.

FRANK CORTESE, 630 West 168th Street, New York, N. Y.

GEORGE W. CROMER, *Junior Chemist,* Bureau of Chemistry and Soils, U. S. Department of Agriculture, Washington, D. C.

E. W. DEAN, *Director,* Standard Inspection Laboratory, Standard Oil Development Co., Bayonne, N. J.

THOMAS W. DELEHANTY, *Assistant Chief*, Chemical Division, Bureau of Foreign and Domestic Commerce, Washington, D. C.

WILLIAM T. DIEFENBACH, *Chief Chemist*, J. M. Huber, Inc., New York, New York.

DAVID B. DILL, *Assistant Professor Biochemistry*, Harvard University, Cambridge, Mass.

G. J. EASTER, *Assistant Director of Research*, The Carborundum Company, Niagara Falls, N. Y.

HENRY ECKHARDT, JR., *Sales Engineer*, Pioneer Power Corporation, New York, N. Y.

A. T. FRASCATI, *Technical Director*, Firmenich and Company, New York, New York.

JOSEPH S. FRIEDMAN, *Consulting Chemist*, Graphic Color Plate Company, New York, N. Y.

OLIVER GROSZ, *Instructor*, Department of Chemistry, Catholic University of America, Washington, D. C.

EDMUND MCK. HAYDEN, *Vice-president and Secretary*, The Stanley Chemical Company, East Berlin, Connecticut.

THOMAS G. HEISER, *Research Director and Chief Chemist*, The Stein-Davies Co., Long Island City, N. Y.

HUGH B. HODGE, JR., *Research Chemist*, Lucidol Corporation, Buffalo, New York.

HORACE B. HUDDLE, *Head, Physical Science Department*, State Teachers' College, Johnson City, Tenn.

L. KIRSCHBRAUN, *Vice-president*, The Flintcote Company, East Rutherford, New Jersey.

ELMER O. KRAEMER, *Group Leader, Research Colloids*, E. I. duPont de Nemours and Company, Wilmington, Delaware.

SYDNEY B. LEVINSON, *President*, Industrial Consulting Laboratories, 128 Water Street, New York, N. Y.

ARTHUR LOCKE, *Research*, Western Pennsylvania Hospital, Pittsburgh, Pennsylvania.

ALEXANDER LOWY, *Professor of Organic Chemistry*, University of Pittsburgh, Pittsburgh, Penna.

ABRAHAM LUSSKIN, *Superintendent*, Everseal Manufacturing Company, Ridgefield, N. J.

WESLEY M. NOBLE, *Assistant Scientific Aide*, Bureau of Chemistry and Soils, Washington, D. C.

JOHN T. NORTON, JR., *Chief Chemist*, Ludlum Steel Company, Watervliet, New York.

WILLIAM B. O'BRIEN, *Director of Chemical Research*, The Dodge Chemical Company, Boston, Mass.

R. H. PATCH, E. F. Houghton and Company, Philadelphia, Penna.

GEORGE W. PEARCE, *Assistant in Research*, N. Y. State Agricultural Experiment Station, Geneva, N. Y.

ROBERT A. PHAIR, *Technical Director*, Laundry Supplies Division, H. Kohnstamm and Company, Inc., New York, N. Y.

CLIFFORD J. ROLLE, Interchemical Corporation, New York, N. Y.

NAT. L. SHEPARD, *Research Chemist*, Aluminum Research Laboratories, Aluminum Ore Company, East St. Louis, Ill.

EUGENE R. SMOLEY, The Lummus Company, New York, N. Y.

G. C. SUPPLEE, *Associate Director of Research*, Research Division, The Borden Company, Bainbridge, N. Y.

LESTER W. TARR, *Assistant to General Manager*, United-Carr Fastener Corporation, South Boston Works, Boston, Mass.

EMIL K. VENTRE, *Associate Chemist*, Carbohydrate Research Division, Bureau of Chemistry and Soils, Washington, D. C.

R. A. WILKINS, *Vice-president,* Revere Copper and Brass Inc., Rome, New York.

WILLIAM WRIGHT, *Chemist,* United Lacquer Manufacturing Company, Linden, N. J.

JUNIOR

JAMES S. WALLERSTEIN, *Chemist,* Wallerstein Company, New York, N. Y.

The application of Chester A. Snell to be raised from Junior to Associate was granted.

Dr. Read reported on the work of the Committee on Membership during the summer.

Mr. Breyer reported for the Committee to Take Over the Committee on Unemployment for Chemists and announced that a definite form of transfer would be presented at the next meeting of the Council.

The next meeting of the National Council was called for Thursday, October 28, 1937.

There being no further business, adjournment was taken.

HOWARD S. NEIMAN,
Secretary.

CHAPTERS

New York

Chairman, William T. Read *Vice-chairman,* D. D. Berolzheimer
Secretary-treasurer, James W. H. Randall
52 East 41st Street
New York, N. Y.

Council Representative, Frederick W. Zerban

Niagara

Chairman, Howard W. Post *Vice-chairman,* William R. Sheridan
Secretary-treasurer, Luther M. Lauer
98 North Buffalo Street
Orchard Park, N. Y.

News Reporter to THE CHEMIST, W. A. Smith
Council Representative, Arthur W. Burwell

Pennsylvania

Chairman, Gilbert E. Seil *Vice-chairman,* Walter L. Obold
Secretary-treasurer, Maurice L. Moore
Sharpe and Dohme, Inc.
P. O. Box 1404
Philadelphia, Penna.

Council Representative, Joseph W. E. Harrisson

Washington

Honorary President, Charles E. Munroe *President*, Louis N. Markwood
Vice-President, Norris W. Matthews *Treasurer*, James B. Martin
Secretary, A. P. Bradshaw
2121 New York Avenue, Washington, D. C.
News Reporter to THE CHEMIST, James F. Couch
Council Representative, Louis N. Markwood

OUR NEW MEMBERS

EUGENE AYRES, F.A.I.C., was educated at Swarthmore, receiving the A.B. degree. Since 1929, he has been employed by the Gulf Research and Development Company, Pittsburgh, Penna., as staff chemist.

JOHN W. BODMAN, F.A.I.C., obtained the B.S. and Ch.E. degrees from the School of Mines and Metallurgy of the University of Missouri. He specializes in glycerine, fatty acid distillation, hydrogenation of vegetable oils, and soap manufacture. His position is research director of Lever Brothers Company, Cambridge, Mass.

GEORGE W. COLEMAN, F.A.I.C., was graduated from Tufts College with the B.S. degree. He specializes in metallography, watch oils, and hair springs, and is research chemist and metallurgist for the Waltham Watch Company, Watertown, Mass.

FRANK CORTESE, F.A.I.C., received the Ch.B. degree from Cornell University, the M.S. degree from the University of Illinois, and the Ph.D. degree from Massachusetts Institute of Technology. He has also studied at Munich and Graz. He specializes in aliphatic diolefines, alkaloids, synthetic nucleosides, reactivities of atoms and groups. He is director of the Intravenous Solutions Department of the Columbia Presbyterian Medical Center, New York, N. Y.

GEORGE W. CROMER, F.A.I.C., obtained the B.S. degree from the University of Illinois, and has also studied at the University of Iowa and George Washington University. He has had over seven years of experience with oxygen bomb calorimetry (coal analysis), and is junior chemist in the Bureau of Chemistry and Soils, U. S. Department of Agriculture, Washington, D. C.

ERNEST W. DEAN, F.A.I.C., holds the B.A. degree from Clark University and the M.A. and Ph.D. degrees from Yale. His preferred chemical fields are petroleum, lubricants, asphalt, and

wood products. He is director of the Standard Inspection Laboratory of the Standard Oil Development Company, Bayonne, New Jersey.

THOMAS W. DELAHANTY, F.A.I.C., is a graduate of Cornell University. Specializing in chemical trade promotion, he is the author of numerous trade journal articles, trade information bulletins, and reported appearances before trade groups. He is assistant chief of the Chemical Division, Bureau of Foreign and Domestic Commerce, Washington, D. C.

WILLIAM T. DIEFENBACH, F.A.I.C., holds the B.Ch. degree from Cornell and has studied at Western Reserve. He specializes in printing inks and materials used in inks and has been employed by J. M. Huber, Inc., New York, N. Y., from 1919 to the present as chief chemist. He has also written several technical papers in the printing ink field.

DAVID B. DILL, F.A.I.C., was graduated from Occidental College and then took the Ph.D. degree at Leland Stanford. Specializing in the physio-chemical properties of blood and muscular activity, he is assistant professor of biochemistry at Harvard University, Cambridge, Mass.

G. J. EASTER, F.A.I.C., received the B.S. degree from Massachusetts Institute of Technology. He is the patentee of a number of patents on refractories, furnaces, abrasives, and is also a registered patent attorney. His position is assistant director of research of The Carborundum Company, Niagara Falls, N. Y.

HENRY ECKHARDT, JR., F.A.I.C., is a graduate of Cooper Union Institute of Technology, and has done graduate work at Columbia University and the Bureau of Standards. He specializes in the production of fine chemicals, industrial application of crystallization, and automatic control of chemical processes. He is sales engineer for the Pioneer Power Corporation, New York, N. Y.

A. T. FRASCATI, F.A.I.C., received the B.S. degree from Syracuse University and has studied at the graduate school of Johns Hopkins University. He is the author of many technical articles on perfumery and cosmetics in trade journals, a field to which he has contributed much research and many manufacturing processes. He is technical director of Firmenich and Company, New York, N. Y.

JOSEPH S. FRIEDMAN, F.A.I.C., obtained the B.S. degree from Harvard, and the Ph.D. degree from the University of Chicago. He is the co-inventor with Edwin H. Land of the process for making Polaroid, and the inventor of the monopack system of color photography. He is consulting chemist for the Graphic Color Plate Company, New York, N. Y.

OLIVER GROSZ, F.A.I.C., received the Ph.D. degree from the State University of Iowa. He specializes in organic and analytical chemistry, and is the author

of a technical article in the organic field. He is instructor at the Catholic University of America, Washington.

EDMUND MCK. HAYDEN, F.A.I.C., obtained the A.B. degree from Yale and the B.S. degree from Massachusetts Institute of Technology. His preferred chemical activity is directing a laboratory developing various types of coatings such as lacquer, synthetic resin coatings, etc. He is vice-president and secretary of the Stanley Chemical Company, East Berlin, Conn.

THOMAS G. HEISER, F.A.I.C., was graduated from Cooper Union. He is particularly interested in research and development work concerning industrial starch products, dextrins, and gums, as well as adhesives. He is research director and chief chemist of the Stein-Davies Company, Long Island City, New York.

HUGH B. HODGE, JR., F.A.I.C., holds the B.Ch. and Ph.D. degrees from Cornell University. He is employed as research chemist by the Lucidol Corporation, Buffalo, N. Y.

HORACE B. HUDDLE, F.A.I.C., was graduated from Ogden College, Georgetown College, University of Illinois, and the University of Chicago, from the latter he obtained the Ph.D. degree. He specializes in the organic chemistry of sesquiterpenes and anthrocyanins, and is the author of several technical articles. He is professor of chemistry and head of the Physical Science Department of the State Teachers College, Johnson City, Tenn.

LESTER KIRSCHBRAUN, F.A.I.C., obtained the B.S. and Ch.E. degrees from the University of Michigan. He specializes in asphalt, cement, and other building materials, and holds over one hundred patents in the field of bituminous emulsions and roofing. He is vice-president in charge of research for the Flintkote Company, Rutherford, New Jersey.

ELMER O. KRAEMER, F.A.I.C., received the Ph.D. degree from the University of Wisconsin, and then continued with study at the University of Upsala, Sweden, and the Kaiser Wilhelm Institute, Berlin. His preferred chemical fields are general and physical chemistry, photography, electrochemistry, inorganic chemistry, cellulose, and the teaching of chemistry. He is research group leader at E. I. du Pont de Nemours and Company, Wilmington, Del.

SYDNEY B. LEVINSON, F.A.I.C., has the B.S. and Ch.E. degrees from the College of the City of New York. He specializes in paints, varnishes, and lacquers, and is president of the Industrial Consulting Laboratories, New York, N. Y.

ARTHUR LOCKE, F.A.I.C., received the B.S. degree from Morningside College and the Ph.D. degree from the University of Chicago. He specializes in biological chemistry, pharmaceutical chemistry, and chemistry in its application to the problems of medicine. He is the author of many technical articles in his chosen fields. He is now doing research on the problems of pneumonia

and the common cold at the Institute of Pathology, Western Pennsylvania Hospital, Pittsburgh, Penna.

ALEXANDER LOWY, F.A.I.C., holds the B.S., A.M., and Ph.D. degrees from Columbia University. Specializing in organic and electro-organic chemistry, he is the author of about forty articles in the technical journals, and three books on organic chemistry, in addition to other publications. He also holds eight patents. His position is professor of organic chemistry, University of Pittsburgh, Pittsburgh, Penna.

ABRAHAM LUSSKIN, F.A.I.C., received the B.S. degree at the College of the City of New York and is now studying at Columbia University. He specializes in paints and varnishes and is superintendent of the Everseal Manufacturing Company, Ridgefield, N. J.

WESLEY M. NOBLE, F.A.I.C., studied at Johns Hopkins University, received the Ph.D. degree from Brown University, and has done graduate work at George Washington University and the U. S. Department of Agriculture Graduate School. He is co-author of a Department of Agriculture publication on soils. His position is assistant scientific aide, Bureau of Chemistry and Soils, U. S. Department of Agriculture, Washington, D. C.

JOHN T. NORTON, JR., F.A.I.C., was graduated from Yale University with the A.B. and Ph.D. degrees. His preferred chemical field is that of metallurgy, and he is chief chemist of the Ludlum Steel Company, Watervliet, New York.

WILLIAM B. O'BRIEN, F.A.I.C., is a graduate of Yale University. He specializes in developing technical products such as disinfectants and cosmetics. He is director of chemical research for the Dodge Chemical Company, Boston, Mass.

RICHARD H. PATCH, F.A.I.C., received the A.B. and Ph.D. degrees from Harvard. He is treasurer and director of plants for E. F. Houghton and Company, Philadelphia, Penna.

GEORGE W. PEARCE, F.A.I.C., obtained the B.S. and M.S. degrees from Pennsylvania State College. He specializes in insecticides and fungicides, the chemistry of lead and calcium arsenates, spray residue investigation, and field biochemistry. He is assistant in research at the New York State Agricultural Experiment Station, Geneva, New York.

ROBERT A. PHAIR, F.A.I.C., is a graduate of Brooklyn Polytechnic Institute. He specializes in the chemistry of laundry processes and holds thirteen patents in this field. He is technical director of the Laundry Supplies Division of H. Kohnstamm and Company, New York, N. Y.

CLIFFORD J. ROLLE, F.A.I.C., received the A.B., M.A., and Ph.D. degrees from the University of Cincinnati. He has done much work in research on

industrial finishes, pyroxylin lacquers and coatings, plasticizers, etc. He is research chemist for Interchemical Corporation, New York, N. Y.

NAT L. SHEPARD, F.A.I.C., is a graduate of the University of Arkansas and has also studied at the University of Arizona. He specializes in non-metallic minerals and ore dressing, and is research chemist at the Aluminum Research Laboratories, Aluminum Ore Company, East St. Louis, Illinois.

EUGENE R. SMOLEY, F.A.I.C., received the B.S., M.S., and D.Sc., degrees from Massachusetts Institute of Technology. He specializes in research on naphthas and lubricating oils. His position is sales engineer for the Lummus Company, New York, New York.

G. C. SUPPLEE, F.A.I.C., holds the B.S., M.S., and Ph.D. degrees from Cornell University. He is the author of numerous publications particularly in the fields of processing of milk and its derivatives; vitamin and nutritional studies; vitamin D activation of milk by ultra-violet rays; isolation and purification of individual milk constituents. He is associate director of research with the Borden Company, Research Division, Bainbridge, New York.

LESTER W. TARR, F.A.I.C., obtained the B.S. degree from Massachusetts College. After several years with E. I. du Pont de Nemours and Company and Continental Diamond Fibre Company he is now assistant to the general manager of the United-Carr Fastener Corporation, South Boston Works, Boston, Mass.

CHARLES E. VANDERKLEED, F.A.I.C., holds the Ph.G., Ph.C., B.Sc., A.C., and Hon. D.Sc. degrees from Purdue University; the Hon. Phar.D. degree from the Medico-Chirurgical College of Philadelphia and the Hon. Phar.M. degree from Philadelphia College of Pharmacy and Science. He has made numerous contributions to pharmaceutical and chemical journals over a period of forty years. He is vice-president and scientific director of the McNiel Laboratories, Inc., Philadelphia, Penna.

THOMAS H. VAUGHN, F.A.I.C., studied at Evansville College and Indiana University and then went to Notre Dame from which he received the B.S., M.S., and Ph.D. degrees. He specializes in organic chemistry and the chemistry of acetylene and its derivatives, and is the author of twenty-five papers in the technical journals. He also holds one patent. He is head of the Department of Organic Research, Union Carbide and Carbon Research Laboratories, Inc., Niagara Falls, N. Y.

EMIL K. VENTRE, F.A.I.C., is a graduate of Audubon Sugar School, and has also studied at Louisiana State University and George Washington University. He specializes in sugar technology, public health bacteriology, water treatment and plant operation, and is associate chemist in the Carbohydrate Research division of the U. S. Department of Agriculture, Washington, D. C.

JAMES S. WALLERSTEIN, J.A.I.C., received the S. B. degree from Harvard, and has done graduate work at Columbia University. He holds the position of chemist with the Wallerstein Company, New York, N. Y.

R. A. WILKINS, F.A.I.C., was graduated from Massachusetts Institute of Technology. He is the author of various papers on copper and copper base alloys, and is vice-president of Revere Copper and Brass Company, Inc., New York, N. Y.

WILLIAM WRIGHT, F.A.I.C., received the B.S. degree in chemistry from Glasgow Technical College. He is now chemist with the United Lacquer Manufacturing Company, Linden, N. J.

FROM OUR READERS

A Museum of International Scientific Contributions to Humanity

To the Editor:

Oglethorpe University, in furtherance of its Museum, has established a section known as the Cavalcade of Science and Industry. It has, as its purpose, the depicting of the developments of all branches of science and industry through various kinds of exhibits in order that the student may study the subjects of these exhibits and their contribution to humanity. Also to offer to the student a more intimate knowledge of the sciences, industrial progress, and their relations to the happiness and the material welfare of society.

The majority of the nations of the world, through their respective governmental departments, (also American and Foreign industrial concerns) have contributed various kinds of exhibits to this section, each telling how it seeks to set the future free; free from disease, from useless toil and ugliness. Each has presented what it considers its distinctive contribution to the comfort, delight, and general welfare of man, via manufacture, architecture, inventions, and almost all the aesthetic and utilitarian products of the human race. These exhibits are illustrated by photographs, diagrams, industrial specimens (the raw material and finished product) and models.

W. EARL HOPPER, *Director*
Hopper Peace Foundation
Oglethorpe University
Georgia

THE AMERICAN INSTITUTE OF CHEMISTS:

This Association notes with satisfaction the efforts which you are making for the passage of a bill at Albany to license chemists. If we can be of any service to you, we should like to cooperate.

Association of Municipal Chemists
of the City of New York.

CHEMISTS ABROAD

By James N. Taylor, F.A.I.C.

FELLOWS and Associates of the Institute of Chemistry of Great Britain and Ireland received notification the early part of September, states an editorial in *The Chemical Trade Journal and Chemical Engineer (London)* for September 10, 1937, of a special general meeting to be held in November, at which they will be asked to approve a draft of a petition for a Supplemental Charter which the Council of the Institute proposes to present to H. M. The King in Council.

The main change proposed is the institution of a third category of members, namely, "Registered Members of the Institute." These registered members will be required to have complied with exactly the same conditions as to training that are stipulated for admission to the Associateship and to have obtained a University degree which is accepted as exempting from any examination by the Institute for admission to the Associateship. They will be required to submit themselves to the Institute's disciplinary code, but will not be allowed to use any letters bearing on the Institute after their names, nor will they participate in any of the privileges or facilities accorded to Fellows or Associates except that of the inclusion of their names in a register, the main inducement attaching to this new category of membership being, apparently, that those admitted will pay a lower entrance fee and annual subscription than do regular Associates.

The proposed change owes its origin to a provision in the Pharmacy and Poisons Act, 1933, whereby the Home Secretary made a rule requiring that supervision of the manufacture of certain classes of pharmaceutical preparations be restricted in the main to registered pharmacists and to Fellows and Associates of the Institute. This proposal aroused the opposition both of the Universities and of those qualified chemists who did not happen to be members of the Institute.

Whether the new proposals of the Council will prove acceptable to chemists still outside the Institute, the future alone will show; in any event they are undoubtedly meant as a definite step forward towards the more complete recognition of the Institute as the registration authority for the profession.

THE ETHICS of Chemistry, an editorial printed last Summer in *Chemistry and Industry (London)* presents much food for thought.

A British correspondent of *Chemistry and Industry* inquired "whether it is certain that a man need not concern himself with the consequences of his acts." In replying, the editorial writer pointed out that when Davy discovered phosgene or Richie mustard gas their warlike possibilities were unthought of. "It is the use of such compounds in war that is to be blamed, not the chemists who discovered them in their peaceful avocations. Whether poison gases are worse than any other warlike weapons we do not know and shall not venture an opinion.

"We should like to ask: how can

scientific men be expected to have the same rational outlook on political affairs that they generally have in their science? They commonly spend several years in studying the particular branch of science to which they are addicted and a few of them think that this learning entitles them to be better fitted than most of their fellows to judge matters of ethics, political economy, psychology, foreign politics, and many other such subjects that have little or no scientific basis . . . . What do the really learned, or we ordinary mortals, know about the great problems that confront us and will probably be decided by the masses of population swayed this way and that by impassioned eloquence? We know about as much as Voltaire's Zadig: 'Il en savait ce Qu'on en a su dans tous les ages; c'est-a-dire fort peu de chose.'"

MESSRS. JUAN P. ZAMBONI and Andres P. S. Roccatagliata, two young Buenos Aires engineers, have returned to Argentina from a trip through the United States and Europe. During their extended trip, they were deeply interested in studying industrial and economic developments in the chemical and allied fields.

PROFESSOR G. G. HENDERSON, D.Sc. L.L.D., retired on September thirtieth from the Regius Chair of Chemistry at Glasgow University, which he has held since 1919. Professor Henderson is a past-president of the Chemical Society and the Institute of Chemistry. In 1916, he was president of Section B (Chemistry) of the British Association.

THE ANALYST

A Tribute by an Inspector, Food and Drug Administration

LEWIS A. SMITH

By hooded bench, bunsen flame and
burette stand,
With tube and flask and sliding-rule,
you earn your livelihood.
Obscurities resolve to elements in your
trained mind and hand;
Votary of the verities; detector of the
bad; preserver of the good.

You swing no bridges, scale no
mountain peaks;
Yet know the heart of steel,
the fibre's tensile strength.
You make no laws nor build utopias
a mad world seeks;
Yet know the atom's soul,
the ion's breadth and length.

Fact-bound toiler! For you no
venturous excursioning;
Precision's slave! For you no changing
of the balanced beam.
Viced by the exactitudes of your high
calling,
Your allegiance is to things that are—
not to what they seem.

For you no plaudits of the multitude;
You make no blazoned bid for fame.
Duty-fettered—there is no interlude;
No time to seek the world's acclaim.

Let others ponder "isms" to which the
fools are prey,
And act on theory born of wild
imagining—
'Tis yours to count, to measure and to
weigh
The reasons for our faith; to give us
understanding.

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NORTHERN LIGHTS

By Howard W. Post, F.A.I.C.

"No Canadian will ever disown the North."—*Andres Siegfried in* "Canada".

It may seem to be a far cry from a bit of theoretical chemical research carried out in 1918 by a Professor from the University of Toronto, at the Geophysical Laboratories of the United States in Washington, to the cessation of a series of damage suits brought by citizens of the United States aganist Canada. Yet there was and still is a very vital connection, as is described in an editorial in *Canadian Chemistry and Industry* for August, 1937. It seems that Professor J. B. Ferguson of Toronto published years ago the results of some of his work on the reaction between carbon monoxide and sulfur dioxide by which carbon dioxide and sulfur are produced. The reaction is of course reversible and the equilibrium subject in its speed of attainment to various influences and these proved quite interesting to Professor Ferguson.

But, to quote the editorial, "in due course" Consolidated Mining and Smelting Co., Ltd., at Trail, B. C. found themselves up against a rather knotty problem. It seems that considerable sulfur dioxide was being evolved from their smokestacks and like all true products of science insisted on disregarding the international boundary line to such an extent that farmers in our own state of Washington began to notice the effects on live stock and general farm efficiency. Since the matter could not be adjusted within the borders of one country it soon became the subject of diplomatic intercourse between Washington and Ottawa with the result that in due course of time good Canadian dollars crossed the border in settlement. This sort of thing could not be expected to go on indefinitely, of course, and it was with considerable interest that work was soon started looking toward the perfection, from a commercial point of view, of Professor Ferguson's work at Washington.

To make a long story short, before long the reaction between carbon monoxide and sulfur dioxide was actually placed on a practical basis, if by practical we mean here advantageous — run with less expense than would be represented by the payment of indemnities to American farmers. And now, according to the editorial, nearly fifty tons of elemental sulfur are produced per day in this manner.

Well, all this sort of industrial application is, in a sense, "old stuff" in principle at least to the average industrial chemist. To many of us, including the writer of the editorial and the writer of this column, the big point is that of coördination between the two branches of chemistry. First there came the theoretical chemist interested, as it so happened in this case, in volcanoes, geologic deposits and underground mysteries. He discovered a certain equilibrium chemical reaction, very simple to write on paper but worthy of long continued study from his point of view and he published his results for whatever they might be worth. Then came the trouble out near the Pacific coast, economic, agricultural, financial — and the literature

was combed and searched for help. Finally came the revelation of work previously done, its commercial application, and success.

We are reminded of a story which is attributed to Faraday. It seems that a skeptical lady visitor once visited him and asked, after an inspection of his laboratory, of what possible value all these machines could ever be to humanity. Faraday replied "Madam, of what value is a new born babe?"

In this same number of *Canadian Chemistry and Metallurgy* we found an article by A. C. Chambron of the National Research Council, Ottawa, entitled "Chemical Utilization of Natural Gas," which proved rather interesting and which we recommend for our readers. Shortness of space alone prevents us from reviewing the high points of this article, but it covers such matters as the utilization of methane, oleins, etc.

Newfoundland imports much of the chemicals necessary for such of her industries as are purely native, for instance the manufacture of newsprint. Figures show the imports of china clay, sulfur, and alum for this purpose during the year 1936 reached the value of $175,795 of which about eighty-nine per cent represents imports from the United States. This shows an increase of nearly twenty-eight per cent over the corresponding figures for 1935.

BOOKS

PREPARATION OF SCIENTIFIC AND TECHNICAL PAPERS. By Sam F. Trelease and Emma Sarepta Yule. 125 pages. *The Williams and Wilkins Company.* $1.50.

This handbook is intended for the use of students who are writing articles on scientific or technical subjects, but it will be of great assistance to anyone who would prepare reports or technical papers. In logical order, the book takes up the plan and arrangement of topics for articles, punctuation, abbreviations of units of weights and measures, approved methods of making literature citations and abstracts, abbreviations for technical journals, acknowledgments, bibliographies, etc. The preparation of articles which contain tables, drawings, or photographs is also treated. In addition, this publication includes a bibliography of books concerned with the editing of technical writing.—W. R.

INVENTIONS AND THEIR MANAGEMENT. By Olf K. Berle and L. Sprague *International Textbook Company.* 745 Pages — Price $4.50

It is the purpose of this book to teach the prospective inventor the business of inventing. "Inventing," to quote the authors, "is a business, and he who would work in this field must, to be successful, know the conditions in it and the rules according to which it is conducted." The prospective inventor must know how to visualize and appraise current opportunities and needs for improvements in the arts, in order that he may confine his efforts to things that will be profitable and avoid wasting time and money on things that will not be profitable. He must also have sufficient grasp of the fundamental principles of patent law and economics so as to be able intelligently and safely to transact business relating to inven-

tions and patents, to determine what constitutes invention and patentability, to evaluate patents and patent situations strategically and financially, and to coöperate to the best advantage with his patent attorney in obtaining, safeguarding, and defending patents.

The book is planned to guide inventors in every aspect of their work from the birth of the idea to the successful exploitation of the resulting patent. It discusses such important topics as preserving proof of conception, the various kinds of patents and the protection they afford, obtaining financial backing, the selection of a competent patent attorney and how to coöperate with him in obtaining the greatest measure of protection, the prerequisites of patentability, Patent Office procedure, how to read patents understandingly, how to proceed to exploit an invention, and how to evaluate a patent. The authors also discuss other important matters such as trade marks, copyrights, foreign patents, and accounting and taxes in relation to patents.

A very important and novel feature of the book is a large number of reference cases, each one of which relates in a very interesting and informative manner the actual experience of an inventor, business man or attorney in the field of inventions and patents. The book also includes an excellent readily accessible glossary of legal, technical, and commercial terms as well as a carefully prepared index, table of cases, and bibliography.

In conclusion, it may be stated that the book makes intensively interesting reading, and what is exceedingly rare in a non-technical book on a highly technical subject, the book is extremely accurate. It may also be stated that the reviewer was very favorably impressed with the logical arrangement of the subject matter as well as with the splendid format and printing of the book itself.

—C. W. Rivise, F.A.I.C.

NEWS

To perpetuate and extend the scientific research work done by Dr. George Washington Carver at Tuskegee Institute, Alabama, plans have recently been completed to establish the Carver Creative Research Laboratories. A. W. Curtis, Jr., Dr. Carver's assistant at Tuskegee, explained that the aim of the proposed laboratories would be to coördinate the hundreds of experiments now being conducted and to disseminate the findings to farmers everywhere.

Plans for the research laboratory include a museum to exhibit the scientific developments of Dr. Carver, and units in chemistry, bacteriology, botany, plant breeding and physics, library, seminar room and spectroscopic room.

The purpose of the laboratories is to serve all, regardless of race or color, particularly in the utilization of waste material and the development of agricultural crops for industrial uses.

A short biography of Dr. Carver appeared in the October, 1936, issue of The Chemist.

The New York Professional Chapter of Alpha Chi Sigma has elected the following officers for 1937-1938: President, Foster Dee Snell, F.A.I.C. Vice-president, R. E. Horsey, F.A.I.C.; Secretary, E. R. Hanson; Treasurer, H. N. LaCroix.

Dr. Lewis W. Douglas, vice-president and member of the board of directors of American Cyanamid Corporation, has been appointed principal and vice chancellor of McGill University, Montreal, Canada, to assume office on January 1, 1938. Dr. Douglas is the first citizen of the United States to receive such an appointment. In 1926, he was elected to Congress, and became director of the United States budget in 1933, resigning in 1934, when the policy of a balanced budget was abandoned.

A new type of laboratory course which will provide training in all the fundamental processes, techniques, and skills of the basic sciences is being given by The American Institute in conjunction with the New York School System and the New York University Division of General Education.

The course will include sixteen sessions in seven different laboratories and will cover the fundamental processes of the physical, biological, and chemical sciences, including instruction in glass, flat metal, turning, casting, plating, electronics, optical techniques, and photographic processes. It is intended primarily for sponsors of science clubs and others whose professional or avocational interests require manipulative or technical skill in the sciences. The course will be directed by Professor H. H. Sheldon and Gustave Wiedeman.

To bring out the lighter and more interesting side of the history and the progress of American Industry, the U. S. Department of Commerce recently presented a series of weekly broadcasts over the Columbia Broadcasting System, discussing more than twenty-three typical American industries. These talks are now published in booklet form and may be obtained for ten cents from the Superintendent of Documents, Washington, D. C.

"The Effect of City Water and Sewerage Facilities on the Market for Air-conditioning Equipment — 1937," is the title of a report prepared by the Bureau of Foreign and Domestic Commerce to afford a factual survey of available water supply in metropolitan centers of the United States and its relation to the market for air-conditioning equipment. Orders should be sent directly to the Bureau of Foreign and Domestic Commerce, Washington, D. C. Ten cents for each copy of the report should be enclosed.

Joseph F. Padlon, F.A.I.C., Captain in the Chemical Warfare Reserves, returned to New York City recently from Plattsburg Barracks after a tour of duty as unit gas officer of the C.M.T.C. His work consisted of instruction in the nature of the different chemical agents used in warfare and in defense against such agents. Mr. Padlon is the author of the article entitled "The Limitations of Physical Science" appearing on page 225 of this issue of THE CHEMIST.

A new popular science magazine, *The Amateur Scientist*, designed to stimulate interest in science with the serious purpose of preparing young Americans to meet the problems they will inherit from their elders, and edited by high school students, was published May third by The American Institute of the City of New York for its

Science Writers' Club. Its publication is part of the extensive program of science for children carried on by the American Institute of the City of New York. Other major projects are the annual Children's Science Fair, workshop courses in the technique of science conducted each spring and fall in coöperation with education agencies in New York, the Annual Christmas Lectures and Science Congress in December, and the sponsorship of three hundred Student Science Clubs.

The Manufacturing Chemists' Association, Washington, D. C., announces that by voluntary agreement of the producers of white arsenates, such as lead arsenate and calcium arsenate, these arsenates will be given a distinctive pink color. This safety measure has been adopted after a five-year study and extensive tests, which indicate that the change of color should provide a satisfactory safeguard against these agricultural insecticides from being mistaken for materials of household or other use. Lead arsenate now being produced for the 1938 crop season is colored pink. The color of calcium arsenate will also be changed to pink when present stocks of this insecticide are exhausted.

The appointment of Dr. G. E. F. Lundell as chief of the Chemistry Division of the National Bureau of Standards, Department of Commerce, to fill the vacancy caused by the retirement of Mr. Percy H. Walker last July, was announced by Dr. Lyman J. Briggs, Director of the Bureau.

Doctor Lundell is an analytical chemist of the first order and has made many important contributions to methods of precise quantitative analysis. Born in Brooklyn, N. Y., January 11, 1881, he attended the public schools and then entered Cornell University, receiving his A. B. degree in 1903. Six years later he was awarded his Ph.D. from the same institution.

From 1910 till 1917 Doctor Lundell served as assistant professor of analytical chemistry at Cornell, but his interest was always primarily in "chemical analyses of a high order," rather than in teaching.

At the urgent request of Doctor Hillebrand, then chief of the Bureau's Chemistry Division, Doctor Lundell qualified under the Civil Service requirements for the position of associate chemist and entered the Bureau's service on July 5, 1917. Since 1919, he has had charge of the section of metal and ore analysis and standard samples, and for the past year and a half has also served as assistant chief of the division.

At the Annual General Meeting of the Society of Chemical Industry held in July, 1937, at Harrogate, England, Foster Dee Snell, F.A.I.C., was elected a vice-president of the society.

The New York Chapter of THE AMERICAN INSTITUTE OF CHEMISTS will meet on the following dates during the fiscal year: October 29th, December 17th, February 25th, and April 22nd. Unless otherwise announced, the meetings will be held in the evening at The Chemists' Club 52 East 41st Street, New York, N. Y.

The first speaker will be Mr. A. Cressy Morrison who will talk on the subject of the employment of chemists.

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